

Fig. 4A: The terms 01, 02, 03, 04, and 05 have been added to the drawing.

Figs. 4B: The terms 01 and 02 have been added to the drawing.

Fig. 8B: The terms 01, 02, and 03 have been added to the drawing.

REMARKS

Objections to the Disclosure:

The Office Action objected to the Disclosure for several informalities, as described on page 2. Accordingly, the Applicants have amended the disclosure to overcome the objections. Applicants submit that they have not added any new matter and all amendments to informalities were fully supported in the application as originally filed.

Therefore, Applicants respectfully request that the objections be withdrawn.

Objections to the Drawings:

The Office Action objected to the Drawings for informalities, as described on page 2. Accordingly, the Applicants have amended the Drawings to conform with the Examiner's requests. The red-lined drawings have been submitted herein.

Therefore, Applicants respectfully request that the objections be withdrawn.

Objections to Claims 3 and 12:

The Office Action objected to claims 3 and 12 as being in improper multiple dependent form. Accordingly, the Applicants have amended claims 3 and 12 to eliminate the multiple dependency. The Applicants submit that no new matter has been added and that the claim amendments were made merely to correct informalities and therefore request that the objections be withdrawn.

35 U.S.C. §11, second paragraph, Rejection of Claims 1, 2, 4-11, 13-16:

The Office Action rejected Claims 1, 2, 4-11, and 13-16 for being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Accordingly, Applicants amended claim1 to eliminate redundancy and correct antecedent basis. Applicants amended claim 4 to clarify the meaning of terms the Office Action found to be vague. Further, Applicants amended claims 13,14, 15, and 16 to clarify the terms "right" and "left." Finally, Applicants clarified claims 1, 4, 6, 7, and 13-16 as requested by the Office Action in pages 3-4.

Therefore, Applicants respectfully request that rejection to the claims be withdrawn and the same be passed to issuance.

The Applicants have reviewed the prior art made of record and do not believe that any of the references affect the patentability of the present invention.

The amendments herein are not intended to and should not be construed to have been made for any reasons related to patentability of the claims. Attached hereto is a marked-up version of the changes made to the claims, specification and drawings by the current amendment. The attachment is captioned "Version With Markings To Show Changes Made."

In view of the foregoing amendments and remarks, early favorable action is solicited.

The Commissioner is hereby authorized to charge \$920.00 for a three (3) month extension of time to Deposit Account No. 50-1628. The Commissioner is hereby authorized to charge any additional fees that may be required for this response, or credit any overpayment to Deposit Account No. 50-1628.

In the event that an extension of time may be required in addition to that requested hereinabove, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 50-1628.

If the Examiner determines that anything is necessary to place the application in better condition for allowance which Examiner believes can be handled via telephone, Applicant respectfully requests that Examiner contact the undersigned attorney at (212) 632-8435. The undersigned may also be contacted by e-mail at mwaldbaum@salans.com.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The Applicants submit this amendment in response to the request to provide a clean version and a marked up version of the amended sentences of the claims, specification, and drawings, provided hereinabove. Changes have been indicated as follows: underlined words are added and bracketed words are deleted.

Please Move Claims from page 8 to new page 9:

In the Claims:

1. (Amended) A filter, comprising:

a block of dielectric material having a top surface, a bottom surface, two opposing first side-walls connecting said top surface to said bottom surface along the width of said block and two opposing second side-walls connecting said top surface to said bottom surface along the height of said block;

two input/output pads on one of said first side walls;

at least three holes extending along the width of said block and extending through said block from said top surface to said bottom surface, wherein at least one of said at least three holes which is located [on] at the end of the at least three holes[, and where said at least one hole's center] is offset, or off a line bisecting the remaining two of the at least three holes;

conductive material substantially covering said bottom surface said first and second side-wall surfaces and said inner surfaces of said at least three holes;

said each holes have patterns of conductive material on said top surface, surrounding said holes;

said center of said [off line] offset hole is a distance Y1 from a center of a[n] hole adjacent to the [off line] offset hole, said distance Y1 being perpendicular to the filter's first side walls;

said center of said [off line] offset hole is a distance X1, from the center of said adjacent hole, said distance X1 being parallel to the filter's first side walls;

a first pattern of conductive material between said offset [off line] hole and the adjacent hole, where said first pattern comprises a first arm of conductive material parallel to [the] an edge of the conductive material of the [off line] offset hole and parallel to the filter's first side walls, a second arm of conductive material perpendicular to said first arm of conductive

material, and a third arm of conductive material parallel to the first arm of conductive material and perpendicular to the second arm of conductive material said first pattern of conductive material is connected to the first of said input/output pads on one of said first side walls;

 said [off line] offset hole has a pattern of conductive material surrounding said hole, said edge of said [off line] offset hole's pattern of conductive material has a capacitance C2 from the edge of conductive material surrounding the adjacent hole, where C2 is the capacitance between two opposite edges of said [offline] offset hole's pattern of conductive material and said adjacent hole's pattern of conductive material;

 where said [off line] offset hole is next to the first arm of conductive material where capacitance C1 between the conductive material surrounding said [off line] offset hole and the first arm of conductive material, where C1 is the capacitance between the [off line] offset hole's pattern on conductive material and said first pattern of conductive material;

 a second pattern conductive material opposite the first pattern of material, where said second pattern has a width, W, and a length, L, said second pattern is connected to the conductive material on one of said first side walls; and

 a capacitance C3 which is the capacitance between said pattern of hole adjacent to said offset [off line] hole and said first pattern; and

 a third pattern of conductive material between [the] a fifth and a sixth hole[s] where said third pattern is connected to said second input/output pad.

3. (Amended) The filter of claims 1 [and] or 2 wherein C1>C3>C2.

4. (Amended) A duplexer filter comprising:

 a block of dielectric material having a top surface, a bottom surface, two opposing side-walls connecting said top surface to said bottom surface along the width of said block and two opposing side-walls connecting said top surface to said bottom surface along the height of said block, said block having a higher band and a lower band;

 three input/ouput pads on one of said side-walls;

 multiple holes spaced along the width of said block and extending through said block from said top surface to said bottom surface, wherein a first hole is located at a first

location and where said first [holes] hole's-center is offset or off a line bisecting the remaining holes;

conductive material substantially covering said bottom surface said side-wall surfaces and said inner surfaces of said holes;

said center of said [off line] offset hole is a distance Y_1 from a center of a hole adjacent to said [off line] offset hole, said distance Y_1 being perpendicular to the width of the filter's side walls;

said center of said [off line] offset hole is a distance X_1 , from the center of said adjacent hole said distance X_1 being parallel to the width of the filter's side walls;

a first pattern of conductive material connected to one of said side walls, where said first pattern is located between said first [off line] offset hole and the next adjacent hole to the first [off line] offset hole and has a width W and a length L ;

a second pattern of conductive material connected to said first input/output pad, where said second pattern is located between a non-[off line] offset hole of lower band and the next adjacent non-[off line] offset hole of higher band;

where said first [off line] offset hole is next to the second pattern of conductive material with a capacitance C_1 between the conductive material surrounding said first [off line] offset hole and the second pattern of conductive material;

a second capacitance C_2 which is the capacitance between the pattern of said next adjacent hole to said first [off line] offset hole and said conductive material surrounding said first [off line] offset hole; and

a third capacitance C_3 which is the capacitance between said second pattern of conductive material and said pattern of said next adjacent hole to said first [off line] offset hole.

6. (Amended) The filter of claim 4 wherein the frequency of the [off line] offset hole at the center of said duplexer filter is nearly equal to that of a higher band of frequencies.

7. (Amended) The filter of claim 5 wherein the frequency of the [off line] offset hole at the center of said duplexer filter is nearly equal to that of a higher band of frequencies.

12. (Amended) The filter of claims 4, 5, 6, 7, 8, 9, 10 [and] or 11 wherein $C_1 > C_3 > C_2$.

13. (Amended) The filter of claim 4 where said [offline] offset hole has a right and left side with reference to the top surface, and wherein the offset hole is after a line of four holes to the right of said [offline] offset hole and four holes to the left said [offline] offset hole.

14. (Amended) The filter of claim 4 where there are two [offline] offset holes, each of said holes having a right and left side with reference to the top surface, the first [offline] offset hole having three holes to the left and four non-[offline] offset holes to the right of its location, with said second [offline] offset hole to the right of the last of said non-[offline] offset holes.

15. (Amended) The filter of claim 4 where there are three [offline] offset holes, each of said holes having a right and left side with reference to the top surface, with one offset hole on each of the two ends of said filter and the third to the right of two non-[offline] offset holes and to the left of three non-[offline] offset holes.

16. (Amended) The filter of claim 4 where the filter has a right end and a left end with reference to the top surface, and where there are two [offline] offset holes, each of the holes having a right side and a left side with reference to the top surface, with one [offline] offset hole on the left end of said filter and the [offline] offset hole having two non-[offline] offset holes to the left of said second [offline] offset hole and three non-[offline] offset holes to the right of said second [offline] offset hole.

In the Specification:

Please replace the paragraphs indicated with the following rewritten paragraphs:

p. 4, 4th paragraph:

Figures 4A-4B illustrate one preferred embodiment of a printed pattern for a filter designed to perform as the equivalent circuit of Figure 3. [C1 is the capacitance of coupling between input/output electrode and resonator Θ_1 ; C2 is the capacitance of coupling between Θ_1 and Θ_2 ; and C3 is the capacitance of coupling between input/output electrode and resonator Θ_2 . Z is the inductance of coupling between Θ_1 and Θ_2 . The shaded portion of the electric pattern, weakens C2. As a result of the weakened C2, Z is relatively strengthened.]

p. 4, 5th paragraph:

Figure 5 compares the similarity in electrical performance between the filter designed in accordance with the present invention shown in Figure 3 and a prior art filter, as shown in Figure 1. [The rigid line is the electrical performance of the present invention shown in Figure 3 and the broken line is that of prior art filter shown in Figure 1.]

p. 4, last paragraph-p. 5, ,first paragraph:

Figure 7A-7B illustrates one preferred embodiment of a printed pattern for a duplexer designed to perform as the equivalent circuit of Figure 6. Figures 7C-7D, 7E-7G, 7G-7H and Figures 7J-7K and additional preferred embodiments and their equivalent circuits.

p. 5, under Detailed Description, please add the following paragraph:

Figure 1 depicts a typical equivalent circuit of a prior art filter while Figure 2 illustrates the typical printed pattern of a prior art filter designed in accordance with the equivalent circuit of Figure 1.

p. 5, under 1st paragraph after Detailed Description, please add the following paragraph:

C1 is the capacitance of coupling between input/output electrode and resonator $\Theta 1$; C2 is the capacitance of coupling between $\Theta 1$ and $\Theta 2$; and C3 is the capacitance of coupling between input/output electrode and resonator $\Theta 2$. Z is the inductance of coupling between $\Theta 1$ and $\Theta 2$. The shaded portion of the electric pattern, weakens C2. As a result of the weakened C2, Z is relatively strengthened.

p. 5, last paragraph:

Furthermore, $\Theta 1$ also functions as a trap resonator by adjusting the coupling of C1, C2 and C3 as to be $C1 > C3 > C2$. Thus, $\Theta 1$ can work as both a transmission pole and a trap resonator. Due to the unique pattern of the filter, $\Theta 1$ can act as both a trap resonator and

transmission pole, thus reducing filter size by eliminating one transmission pole. (See Figures 3 and [4A-B] 4A)

p. 6, 3rd paragraph:

Fig. 4B shows parameters C1, C2 and C3. C1 is controlled by the distance between pattern 1 (not shown) of conductive material for input/output electrode and pattern 3 (not shown) of conductive electrode connected to conductive material on the inner surface of hole of $\Theta 1$ resonator (Fig. 3), and C3 is controlled by the distance between pattern 1 (not shown) and pattern 4 (not shown) of conductive material connected to conductive material on the inner surface of hole of $\Theta 2$ resonator (Fig. 3). C1, C2 and C3 are capacitances of coupling as described above in Figure 4B. Z is an inductive coupling and is controlled by the pattern 2 (not shown) of conductive material that is opposed to the pattern 1 (not shown) and is connected to the conductive material on the side wall. The relationship of C1, C2 and C3, to each other is as follows, C1>C3>C2.

p. 7, 1st full paragraph:

We can also apply the concepts of this new filter technology to a duplexer. Figures 7A-7B is an embodiment of a printed pattern duplexer of the present invention. Figure 6 is its equivalent circuit for a duplexer designed in accordance with another embodiment of the present invention. Figure 6 and Fig. 7A-7K show examples of new equivalent circuits and printed patterns, as applied to a duplexer. The duplexer of Fig. 6 and Figs. 7A-7B has eight (8) transmission poles and three (3) trap resonators, but it can work as a filter with nine (9) transmission poles and three (3) trap resonators. In most cases, the higher [brand] band is the receiver band and the lower band is the transmitter band at the mobile phone terminal sides. These designations become reversed at the base station sides. However, it is noted that the relationship of the receiver band and the transmitter band, on the one hand, and the higher/lower bands on the other hand are not always consistent.

p. 7, 2nd full paragraph:

The frequency of the [off line] offset hole at the center of the duplexer is nearly equal to that of higher band. In this case, higher band side is the right side of duplexer in Figure 7A. One

embodiment of the duplexer filter has three input/ouput pads and three patterns of conductive material connected to those pads. The duplexer filter may or may not have trap holes at both sides of the filter.

p. 8, Insert these paragraphs before the last paragraph before What is Claimed Is:

Figures 7C-7K show alternative embodiments of the dielectric block of the present invention and their equivalent circuits. The values of W, X, Y1 and L are varied as is optimal for the present invention.

Figure 8A illustrates another embodiment of the present invention, with Figure 8B showing the equivalent circuit. This figure has two (2) transmission poles and one (1) trap resonator, ,but it can work as a filter with three (3) transmission poles and one (1) trap resonator.

In the Drawings:

Figs. 1, 2, 9, 10, 11: The term "Prior Art" has been added to the description.

Fig. 4A: The terms θ_1 , θ_2 , θ_3 , θ_4 , and θ_5 have been added to the drawing.

Figs. 4B: The terms θ_1 and θ_2 have been added to the drawing.

Fig. 8B: The terms θ_1 , θ_2 , and θ_3 have been added to the drawing.